

SNC 2D1 CHEMISTRY IN ACTION TEST  
MULTIPLE CHOICE

Other than a calculator and any tables provided with this booklet, no other aids are permitted.

Do not write on this question paper.

Please mark an "X" through the letter of your choice on the answer grid provided.

1. One neutral atom of  $^{200}_{82}\text{Pb}$  contains  
(a) 82 neutrons, 200 protons, 200 electrons (b) 82 protons, 118 electrons, 82 neutrons  
(c) 82 electrons, 118 neutrons, 82 protons (d) 82 protons, 200 neutrons, 82 electrons
2. How many valence electrons are there in one atom of sulphur?  
(a) 6 (b) 2 (c) 8 (d) 4
3. A bright yellow solid substance is known to be an element. It is brittle and will shatter if hit with a hammer. It is a poor conductor of both heat and electricity. This element is best called a(n):  
(a) alkali metal (b) metal (c) nonmetal (d) noble gas
4. Which of the following is the correct electron dot diagram of a magnesium ion?  
(a)  $\left[ \begin{array}{c} \cdot\cdot \\ \cdot\text{Mg}\cdot \\ \cdot\cdot \end{array} \right]^{6-}$  (b)  $\left[ \begin{array}{c} \cdot\cdot \\ \cdot\text{Mg}\cdot \\ \cdot\cdot \end{array} \right]^{+6}$  (c)  $\begin{array}{c} \cdot\cdot \\ \text{Mg} \end{array}$  (d)  $\left[ \text{Mg} \right]^{+2}$  (e)  $\left[ \text{Mg} \right]^{-2}$
5. What will magnesium oxide produce when dissolved in water?  
(a)  $\text{Mg}^{2+}$  and  $\text{H}^{+}$  (b)  $\text{Mg}^{2+}$  and  $\text{OH}^{-}$  (c)  $\text{Mg}^{2+}$  and  $\text{O}^{2-}$  (d)  $\text{MgO}_{(\text{aq})}$
6. During an investigation, a student observed that when aluminum was placed in an acid solution, bubbles of hydrogen gas were produced and the aluminum was used up. The student also observed that when gold was placed into the same acid, there was no reaction. Based on these observations, the student was able to list the three elements in order from the most reactive to the least reactive. What is the correct order?  
(a) aluminum, gold, hydrogen (b) gold, hydrogen, aluminum  
(c) hydrogen, gold, aluminum (d) aluminum, hydrogen, gold
7. A gas can be proved to be oxygen by means of:  
(a) a burning splint, which causes a small explosion or "pop"; (b) a glowing splint, which bursts into flame;  
(c) a burning or glowing splint which goes out completely; (d) limewater, that goes milky when shaken with the gas;
8. A gas is proved to be carbon dioxide if:  
(a) a glowing splint bursts into flames in the gas. (b) a burning splint causes a small explosion in the gas.  
(c) limewater goes milky when shaken with the gas. (d) an unlit splint ignites in the gas.
9. Which chemical equation is not balanced?  
(a)  $\text{C}_6\text{H}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 3 \text{H}_2$  (b)  $\text{S}_8 + 8 \text{O}_2 \rightarrow 8 \text{SO}_2$   
(c)  $2 \text{Na} + \text{Cl}_2 \rightarrow 2 \text{NaCl}$  (d)  $2 \text{HgO} \rightarrow \text{Hg} + \text{O}_2$
10. When an unknown compound was dissolved in water, the following observations were recorded:  
i) blue litmus paper turned red ii) conducted electricity iii) reacted with a metal to produce hydrogen gas  
What is this compound?  
(a) an acid (b) a metal (c) a metal oxide (d) a non-metal oxide
11. When an acid reacts with a base, which of the following products are created?  
(a) water and a metal (b) a metal and a salt (c) a salt and water (d) water and a non-metal
12. Compare a pH of 8.0 to a pH of 10.0. The first pH is ...  
(a) 2 x more acidic (b) 100 x more acidic (c) 100 x more basic (d) 2x more basic
13. In basic solutions the hydrogen ion concentration is  
(a) > hydroxide (b)  $< 10^{-7}$  (c)  $10^{-7}$  (d)  $> 10^{-7}$

14. Element X reacts with oxygen to form Compound Y. Compound Y reacts with water to form a solution that turns litmus blue. What is Element X?  
 (a) metal (b) nonmetal (c) basic oxide (d) acidic oxide (e) base
15. The longer the time taken for a chemical reaction to occur:  
 (a) the higher the temperature of the reactants (b) the faster the rate of reaction  
 (c) the slower the rate of reaction (d) the faster the molecules of the reactants are moving
16. Which of the following are true in order for a chemical reaction to take place:  
 1. the reactant molecules must be moving. 2. the reactant molecules must collide.  
 3. the collision speed must be above a certain minimum. 4. the reactant molecules must be in liquid or gas state.  
 (a) 1 and 2 only (b) 2 and 3 only (c) 1, 2, and 3 only (d) 1, 2, and 4 only
17. Increasing the concentration of the reactants increases the rate of a chemical reaction because:  
 (a) a larger fraction of the collisions are effective; (b) the frequency of collisions increases;  
 (c) the average speed of the molecules increases; (d) the surface area expands as concentration increases.
18. Which of the following statements is incorrect about catalysts?  
 (a) They speed up the rate of reaction. (b) They increase the rate at which the products are created.  
 (c) They are used up in the reaction. (d) They increase the rate at which the reactants are used up.

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COLUMN MATCH

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Please mark an "X" through the letter of your choice on the answer grid provided.

For each question from column A select the most correct match from column B. Record your answers on the Answer Grid provided. [6 marks]

Column A		Column B
19. Substances which conduct a current when in solution	a	Electrolytes which also contain the hydroxide ion
20. Reaction between an acid and a base	b	Indicators
21. Exothermic	c	Solutions with pH < 7
22. Acidic oxide	d	The oxide of a metal
23. Electrolytes which also contain the hydronium ion	e	A reaction in which the temperature increases.
24. Substances which change color in the presence of an acid or a base	f	A reaction in which the temperature decreases
	g	Electrolytes
	h	Neutralization
	i	The oxide of a non-metal
	j	Calcium carbonate
	k	Positively charged particle found in the nucleus of the atom

Match each description in column A with the correct term in column B. Use each term only once. Record your selections on the Answer Grid provided. [4 marks]

COLUMN A	COLUMN B
25. $\text{Ca(OH)}_2 \rightarrow \text{CaO} + \text{H}_2\text{O}$	A synthesis
26. $\text{Cl}_2 + 2 \text{KBr} \rightarrow \text{Br}_2 + 2 \text{KCl}$	B decomposition
27. $\text{Pb(NO}_3)_2 + 2 \text{KI} \rightarrow \text{PbI}_2 + 2 \text{KNO}_3$	C neutralization
28. $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$	D double displacement
	E single displacement